

MAGNETIC TUNNEL JUNCTION MEMORY DEVICE

ABSTRACT OF THE DISCLOSURE

5 A memory cell for magnetic random access memory devices based on a magnetic tunnel junction (MTJ) memory element with a perpendicular orientation of magnetization in pinned and free magnetic layers, and a tunnel barrier layer sandwiched between the pinned and free layers. The memory cell can include the MTJ memory element, a magnetic flux guide in series with selection devices, such as a bit line, a word line, and a transistor. The magnetic flux guide can have two electrically conductive magnetic portions with the MTJ memory element positioned between the magnetic portions. The MTJ memory element is magnetically isolated from the magnetic flux guide by thin non-magnetic conductive spacers. The MTJ memory element is arranged in a vertical space between the intersecting bit and word lines at their intersection region. The memory cell 10 also includes write and excitation lines. The write line is parallel to the bit line and the excitation line is parallel to the word line. The write and excitation lines also intersect each other and define a corner. The MTJ memory element is positioned in the corner of the intercepting write and excitation lines.

20

C:\Alla\Patents\2004001\Application.wpd